

Remarks

This application has been reviewed in light of the Office Action of August 9, 2005. Claims 1-16 are pending, and all claims are rejected. In response, claim 1 is amended; claim 9 is canceled, without prejudice; and the following remarks are submitted. Reconsideration of this application, as amended, is requested.

Claim 14 is objected to on the ground that "objective" should be "objective lens". Actually, "objective" is correct, see para. [0021] of the Specification. The objective 26 performs the function of an objective imaging element, but it can include optical elements other than lenses as described in para. [0021]. "Objective" rather than "objective lens" is the usual term for such a structure. Applicant asks that the Examiner reconsider and withdraw the objection.

Claims 1-16 are rejected under 35 USC 103 over Courtial ("Design...") or Padgett US Patent 5,781,293 in view of Kalawsky GB 2,268,022. This statement of the rejection is ambiguous, and Applicant asks for clarification. Does the rejection mean "(Courtial or Padgett) in view of Kalawsky", or does it mean "Courtial or (Padgett in view of Kalawsky)"? Based on the language in the second full paragraph on page 3 of the nonfinal Office Action, Applicant will respond as though it means "(Courtial or Padgett) in view of Kalawsky", and requests clarification and a new nonfinal office action if that understanding is incorrect.

The following principle of law applies to all sec. 103 rejections. MPEP 2143.03 provides "To establish prima facie obviousness of a claimed invention, all claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). All words in a claim must be considered in judging the patentability of that claim against the prior art. In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970)." [emphasis added] That is, to have any expectation of

rejecting the claims over a single reference or a combination of references, each limitation must be taught somewhere in the applied prior art. If limitations are not found in any of the applied prior art, the rejection cannot stand. In this case, the applied prior art references clearly do not arguably teach some limitations of the claims.

Neither Courtial nor Padgett teaches “an imaging polarimeter sensor” as recited in the claims. Both of these references teach Fourier transform spectrometers, see their titles, their texts, and the illustration of the results such as Figure 4 of Cordial and Figures 5, 10(a) and 10(b) of Padgett. Thus, neither of the primary references teaches the type of imaging device recited in the present claims. Although the discussions of these references in the explanation of the rejection suggests that they teach “polarized polychromatic image beam” as recited in the present claims, they do not. If this position is maintained, Applicant asks that the location in each reference teaching an image of a scene be set forth.

Kalawsky teaches an imaging device, but it is not a polychromatic imaging device. At page 1, lines 4-7, Kalawsky acknowledges that his polarization image detector does not illustrate the color of the scene, i.e., a polychromatic image.

These distinctions are reflected in the recitations of the claims.

Claim 1 recites in part:

“an achromatic beam-splitting polarizer that receives a polychromatic image beam of a scene and simultaneously produces a first polarized polychromatic image beam and a second polarized polychromatic image beam” (emphasis added)

Claim 12 has a similar recitation.

Neither Courtial nor Padgett has such a teaching. These two reference teach essentially the same structure, note the degree of commonality in the listed authors of Courtial and the listed inventors of Padgett, the similarity in the drawings such as Figure 1 of Courtial and Figure 7 of Padgett, the similarity of the dates, and the

similarity of the description of the inventions. In each case, the reference teaches a Wollaston prism positioned between two crossed polarizers (see Fig. 1 of Courtial and Figure 7 of Padgett, for example). As stated near the bottom of the second column on page 6698 of Courtial,

“When a Wollaston prism is placed between crossed polarizers and illuminated by a point light source, nonlocalized straight-line interference fringes are observed after the second polarizer.”

See also col. 2, lines 33-62 of Padgett.

That is, the arrangements of the optical components of Courtial and Padgett produce interference fringes, not “a first polarized polychromatic image beam and a second polarized polychromatic image beam” as recited in claim 1 and claim 12, and thence in all of the rejected claims.

Kalawsky also does not teach this claim limitation, “simultaneously produces a first polarized polychromatic image beam and a second polarized polychromatic image beam”. Kalawsky’s device “illustrates surface structure of the scene rather than reflection intensity or colour” (page 1, lines 5-7). This lack of a polychromatic image is to be expected. As seen for example in Figure 1 of Kalawsky, the disclosed polarization image detector uses only a Wollaston prism 2, without any additional prism. Without being aware of the specific reference, Applicant had distinguished this type of structure in para. [0012] of the present application, stating in part:

“A Wollaston prism (or other type of polarizing prism), when used by itself, is therefore essentially restricted to single wavelengths or, at most, a narrow wavelength band when used in imaging applications. However, when used in conjunction with at least one additional prism, which is preferably at least one grating, the combination produces two polarized output beams where the angle between the polarized output beams is not dependent (or is weakly dependent) upon the wavelength of the input

beam. The input beam may therefore be a wide-band beam, with a broad spectral band that is found in most scene images and is required for most practical image analysis applications. The wide-band beam is divided into two wide-band [i.e., “polychromatic”, see definition in para. [0020] of the present application] polarized output beams that are of different polarizations and are angularly (and thus spatially) offset from each other.” [bracketed explanatory material added]

Because Kalawsky teaches only the Wollaston prism without another prism, his device does not produce polychromatic image beams that are incident upon the detector. Each of claims 1 and 12 also recites in part:

“an imaging optics system that images the first polarized polychromatic image beam and the second polarized polychromatic image beam onto the imaging detector”.

None of the references has any such teaching. Courtial and Padgett teach interference fringes, not a polychromatic image beam that can be imaged. Kalawsky teaches a non-polychromatic image beam.

Claim 1 recites, and claim 12 has a similar recitation:

“an imaging detector that receives the first polarized polychromatic image beam and the second polarized polychromatic image beam and produces an output image signal of the scene responsive to the first polarized polychromatic image beam and the second polarized polychromatic image beam”

The explanation of the rejection, at page 3, second full paragraph, observes that “Courtial or Padgett do not explicitly disclose producing an output image signal responsive to the first polarized polychromatic image beam and the second polarized

polychromatic image beam” and then goes on to assert that “It would have been obvious to modify Courtial or Padgett with the detectors as taught by Kalawsky...” Applicant traverses this position. Courtial and Padgett produce interference patterns, not images of the scene, see Figure 4 of Courtial and Figures 5 and 10 of Padgett.

Claim 12 further recites in part:

“at least one grating through which the polychromatic image beam passes either before or after it passes through the Wollaston prism”

None of the three references mentions a grating in any way. The explanation of the rejection at the top of page 5 of the nonfinal Office Action references the rejection of claim 3. The explanation of the rejection of claim 3 at the top of page 4 of the nonfinal Office Action makes an unsupported statement about modifying references with the addition of gratings. One cannot arbitrarily modify an optical device with other optical elements, particularly in the case where the devices of Courtial and Padgett produce interference patterns rather than images of the scene.

Applicant next addresses the dependent claims.

Claim 2 recites in part:

“a Wollaston prism through which the polychromatic image beam passes, and

at least one additional prism through which the polychromatic image beam passes either before or after it passes through the Wollaston prism.”

None of the reference has any such teaching. The explanation of the rejection refers to Padgett, but Padgett also has crossed polarizers that result in the production of an interference pattern. These additional elements change the nature of the result. The language “through which the polychromatic image beam passes either before or after it passes through the Wollaston prism” is not taught by Padgett or any other reference.

Each of claims 3-6 recite “at least one grating” or “at least one blazed grating”, and in some cases two gratings. None of the applied references has any teaching of a grating or a blazed grating, nor does the explanation of the rejection suggest where such a teaching is found in any of the references.

Each of claims 7 and 13 recites in part “a half-wavelength plate”. This recitation is made in the context of the parent claims, which recite an imaging polarimeter. That Padgett uses a half-wave plate in an entirely different context, a Fourier transform spectrometer, does not suggest that it be used in an imaging polarimeter.

Each of claims 10 and 15 recites in part:

“the first polarized polychromatic image beam is imaged onto a first portion of the imaging detector, and the second polarized polychromatic image beam is imaged onto a second portion of the imaging detector spatially separated from the first portion of the imaging detector.”

Kalawsky does teach spatially separate detectors. However, it would not be expected to incorporate that teaching into either Courtial or Padgett because to form an interference pattern the two separate interference beams must coincide at the detector array 30, as shown in Figure 5 of Padgett and Figure 1 of Courtial. Spatial separation would lead to inoperability of the approach of Courtial and/or Padgett.

Each of claims 11 and 16 recites in part:

“the first polarized polychromatic image beam and the second polarized polychromatic image beam are interlineated on the imaging detector”.

The explanation of the rejection relies on Courtial and Padgett for this teaching, but in fact neither of these reference have either a first or a second polychromatic image beam. Further, the interference beams of Courtial and Padgett must coincide to produce an interference, not be interlineated as that term is described in para. [0032] of the present application. Production of an interference pattern requires that two interference

beams interact, not be interlineated.

The following comments apply to all of the rejections. The present rejection is a sec. 103 combination rejection. It is well established that a proper sec. 103 combination rejection requires more than just finding teachings in the references of the elements recited in the claim (but which was not done here). To reach a proper teaching of an article or process through a combination of references, there must be stated an objective motivation to combine the teachings of the references, not a hindsight rationalization in light of the disclosure of the specification being examined. MPEP 2143 and 2143.01. See also, for example, In re Fine, 5 USPQ2d 1596, 1598 (at headnote 1) (Fed.Cir. 1988), In re Laskowski, 10 USPQ2d 1397, 1398 (Fed.Cir. 1989), W.L. Gore & Associates v. Garlock, Inc., 220 USPQ 303, 311-313 (Fed. Cir., 1983), and Ex parte Levengood, 28 USPQ2d 1300 (Board of Appeals and Interferences, 1993); Ex parte Chicago Rawhide Manufacturing Co., 223 USPQ 351 (Board of Appeals 1984). As stated in In re Fine at 5 USPQ2d 1598:

"The PTO has the burden under section 103 to establish a prima facie case of obviousness. [citation omitted] It can satisfy this burden only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references."

And, at 5 USPQ2d 1600:

"One cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention."

Following this authority, the MPEP states that the examiner must provide such an objective basis for combining the teachings of the applied prior art. In constructing such rejections, MPEP 2143.01 provides specific instructions as to what must be shown

in order to extract specific teachings from the individual references:

“Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention when there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).”

* * * * *

“The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.” In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).”

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“A statement that modifications of the prior art to meet the claimed invention would have been ‘well within the ordinary skill of the art at the time the claimed invention was made’ because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a prima facie case of obviousness without some objective reason to combine the teachings of the references. Ex parte Levengood, 28 USPQ2d 1300 (Bd.Pat.App.& Inter. 1993).”

Here, there is set forth no objective basis for combining the teachings of the references in the manner used by this rejection, and selecting the helpful portions from each reference while ignoring the unhelpful portions. An objective basis is one set forth in the art or which can be established by a declaration, not one that can be developed in light of the present disclosure. If the rejection is maintained, Applicant asks that the Examiner set forth the objective basis found in the references themselves for combining

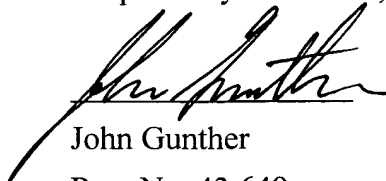
the teachings of the references, and for adopting only the helpful teachings of each reference and disregarding the unhelpful teachings of the reference.

The explanation of the rejection asserts (page 3 of nonfinal Office Action, lines 16-19) that "It would have been obvious to modify Courtial or Padgett with the detectors as taught by Kalawsky to produce output image signals responsive to the first polarized polychromatic image beam and the second polarized polychromatic image beam to analyze the image signal easier." Applicant must traverse this position for two reasons. First, neither Courtial nor Padgett teaches a polarized polychromatic image beam. These references teach interfering beams. Second, to produce an image output signal in either Courtial or Padgett would render the teachings of the reference unsatisfactory for their intended purpose and would change their principle of operation, because these references each teach an output that is an interference pattern. MPEP 2143.01 provides that, in constructing a sec. 103 rejection, the proposed modification cannot render the prior art unsatisfactory for its intended purpose or change the principle of operation of a reference. MPEP 2143.02 requires that, in combining the teachings of two references, there must be a reasonable expectation of success in the combination. Both of these mandates would be violated in the proposed approach of combining the teachings of Kalawsky with those of Courtial and/or Padgett.

For these reasons, Applicant submits that the rejection does not teach the approach recited in the present claims. Applicant asks that the Examiner reconsider and withdraw this ground of rejection.

September 8, 2005

Respectfully submitted,

A handwritten signature in black ink, appearing to read "John Gunther", written over a horizontal line.

John Gunther

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